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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/022,383	10/30/2001	Volker Rasche	NL000577	5417

24737 7590 07/08/2003

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER
THOMAS, COURTNEY D

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/022,383	RASCHE ET AL.
	Examiner	Art Unit
	Courtney Thomas	2882

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klotz et al. (U.S. Patent 5,852,646) in view of Pflaum (U.S. Patent 6,324,254) and Fluhrer et al. (U.S. Patent 6,266,553).

3.

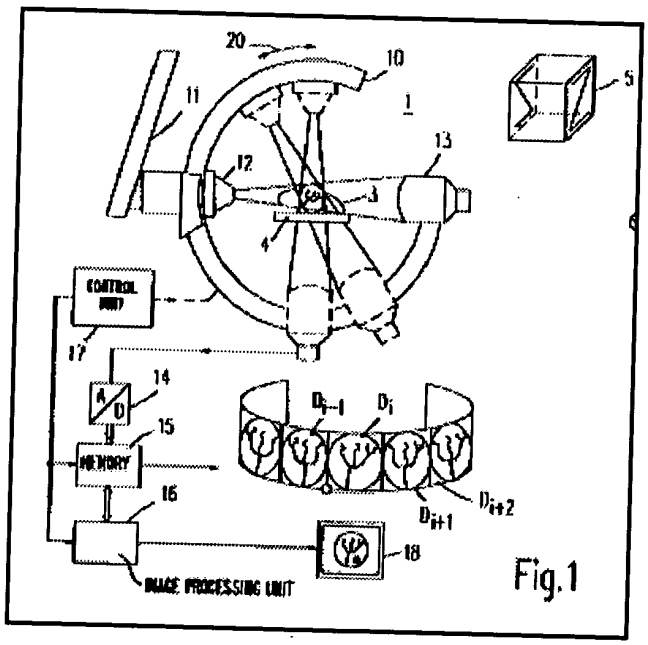


Figure 1 - U.S. Patent 5,852,646 to Klotz et al.

4. **As per claims 1 and 6**, Klotz et al. disclose a method (and apparatus) comprising: forming a set of 2-dimensional images (**18**) of an object (**3**) to be examined, by means of a scan rotation of an X-ray source (**12**) around said object over a run length (**20**).

5. Klotz et al. do not explicitly disclose a method wherein X-ray images are acquired at predetermined moments in a cardiac cycle of the object and reconstruction of a 3-dimensional volume thereof wherein the run length of the scan rotation over 180 degrees is at least 15 seconds and preferably about 20s and wherein the number of measuring points in successive cardiac cycles for reconstructing a 3-dimensional volume is reduced.

6.

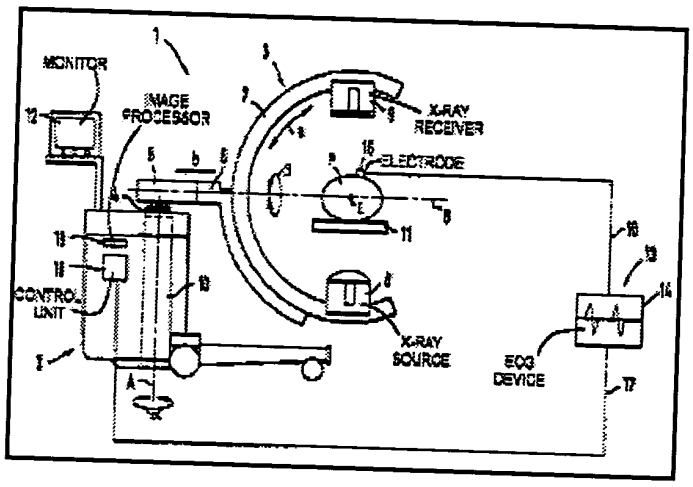


Figure 1 - U.S. Patent 6,324,254 to Pflaum

7. Pflaum discloses a method wherein X-ray images are acquired at predetermined moments in a cardiac cycle (abstract, column 2, lines 52-58) and wherein reconstruction of a 3-dimensional volume occurs as a result of the scan rotation occurring over 180 degrees and at least 15 seconds (column 2, lines 17-32).

8.

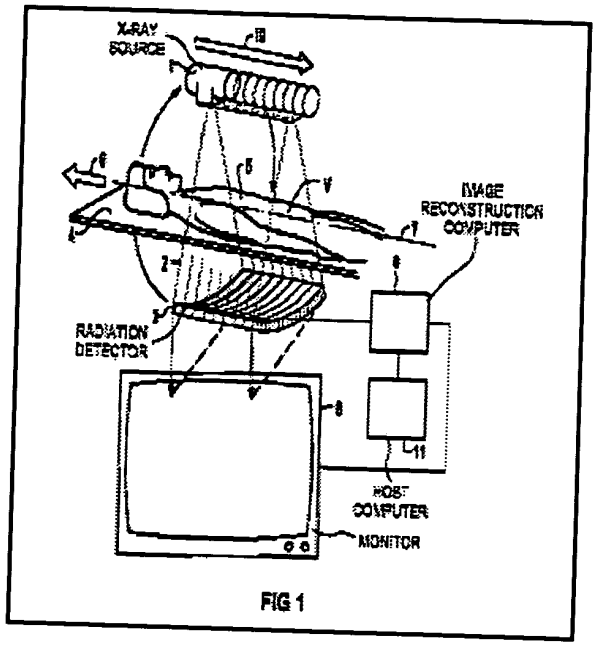


Figure 1 - U.S. Patent 6,266,553 to Fluhrer et al.

9. Fluhrer et al. teach a method wherein the selection of a particular portion of a cardiac cycle (i.e. the diastole) results in a reduction of the number of measuring points in successive cardiac cycles. Fluhrer et al. teach that such selection also results in imaging containing low motion artifacts, and results in reduced radiation exposure to a patient or object of interest (column 1, lines 64-67, column 2, lines 1-2, 5-9).

10. It would have been obvious to modify the method of Klotz et al. such that it incorporated the method of Pflaum and Fluhrer et al. One would have been motivated to make such a modification so that a sufficient number of images are obtained to illustrate stroboscopic changes in the imaged object as taught by Pflaum (column 2, lines 17-32). Additionally, a practitioner in the imaging art could also configure the system such that image capture is performed at particular times to reduce motion artifacts due to the movement of internal organs of a patient and to reduce the total radiation exposure during the imaging process as taught by Fluhrer et al. (column 1, lines 64-67, column 2, lines 1-2, 5-9).

11. **As per claims 2-4**, Klotz et al. as modified, do not explicitly disclose a method wherein **a)** before reconstruction, images obtained at predetermined corresponding characteristic time moments in

successive cardiac cycles are correlated with each other **b)** wherein the characteristic time moments substantially correspond to R-peaks of the cardiac cycle **c)** before a reconstruction, images obtained at predetermined neighboring time moments in a predetermined characteristic time interval of a cardiac cycle are correlated with each other and **d)** reconstruction is combined with modeling techniques.

12. It would have been obvious to further modify the method of Klotz et al., such that it incorporated the aforementioned claims. One would have been motivated to make such a modification so that image capture is performed at particular times to reduce motion artifacts due to the movement of internal organs of a patient. Additionally, categorizing images with capture parameters allows for analysis of time dependent changes in the imaged object.

Response to Arguments

13. Applicant's arguments filed 06.24.03 have been fully considered but they are not persuasive. In particular, Klotz et al. (U.S. Patent 5,852,646) disclose a method and apparatus configured to form a set of 2-dimensional images (**18**) of an object (**3**) to be examined, by means of a scan rotation of an X-ray source (**12**) around said object over a run length (**20**). As noted above, Klotz et al. do not explicitly disclose a method wherein X-ray images are acquired at predetermined moments in a cardiac cycle of the object; reconstruction of a 3-dimensional volume thereof wherein the run length of the scan rotation over 180 degrees is at least 15 seconds and preferably about 20s and wherein the number of measuring points in successive cardiac cycles for reconstructing a 3-dimensional volume is reduced.

Pflaum (U.S. Patent 6,324,254) and Fluhrer et al. (U.S. Patent 6,266,553) are provided for their disclosure in the practice of acquiring images of a patient during a specified moment of a cardiac cycle. Pflaum teaches a method comprising the step of reconstructing a 3D volume wherein semi-stationary images can be acquired. Fluhrer et al. teach that the selection of a particular portion of a cardiac cycle (i.e. the diastole) results in a reduction of the number of measuring points in successive cardiac cycles, whereby

reconstruction techniques are capable of utilizing smaller data sets for image generation. Examiner notes that the limitations outlined in independent claims 1 and 6 are known to practitioners in the imaging art as techniques for obtaining artifact free images of moving organs and/or vessels. It is well within the skill of practitioners in the imaging art to modify systems such that imaging systems obtain data for reduced processing time, produce artifact free images for medical analysis, and incorporate the benefit of reducing radiation exposure to a patient.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (703) 306-0473. The examiner can normally be reached on M - F (9 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308 4858. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

Courtney Thomas

June 30, 2003

EDWARD J. GLICK
Supervisory Patent EXAMINER
TECHNOLOGY CENTER 2800